New or Little-Known Crane Flies from Iran. III (Diptera: Tipulidae)[1]

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Abstract: Part II of this series of papers concerning the crane flies of Iran was published in this Journal (82: 279–284, 1974). In that report various species of the Eriopterine genus *Gonomyia* were considered and in the present paper further new species and records in the Eriopterini are provided. The species here described are *Lipsothrix* **iranica**, *Cheilotrichia* (*Empeda*) **gnoma**, *Erioptera* (*Pseuderioptera*) **schmidi**, *E.* (*Psiloconopa*) **cancriformis**, and *Molophilus* (*Molophilus*) **pallidipes**, all from the Elburz Mountains in northern Iran. Additional to the above novelties, 13 further previously described European species are added to the list of species of Tipulidae from Iran.

In the preceding two reports on the crane flies of Iran that were collected by Dr. Fernand Schmid in 1955 and 1956 a portion of the species belonging to the tribes Pediciini and Eriopterini were treated. At this time I am discussing the remaining members of the Eriopterini contained in the collection and supplying several records of previously described species hitherto known from Europe. I again extend my deepest thanks to Dr. Schmid for his work in collecting this valuable series of crane flies from a scarcely known area of southern Asia.

One of Schmid's important papers on the Trichoptera of Iran provides full information concerning the various stations in the Elburz Mountains where the present series of flies was taken and should be consulted (*Trichoptères d'Iran*. Beiträge zur Entomologie, 9: 200–219, 376–389; 1959). This paper includes a map showing itinerary and collecting stations, and complete geographical data for this expedition, September 1955 and April to October 1956, with eight photographs showing especially important collecting localities.

Lipsothrix **iranica**, n. sp.

Mesothorax orange, pronotum yellow, narrowly brownish black medially; legs yellow, femoral tips narrowly black, tibiae yellow, extreme bases and tips darkened; wings pale yellow, stigma dark brown, conspicuous, vein R_{2+3+4} short and straight, longer than the strongly arcuated basal section of R_5; abdomen yellowed, patterned with black, outer two segments yellow.

Female. Length about 11 mm.; wing 9.5 mm.; antenna about 1.8 mm.

Rostrum orange; palpi brownish black, unusually long, nearly one-half the antennae; terminal segment about one-third longer than the more slender third segment. Antennae

[1] Contribution from the Entomological Laboratory, University of Massachusetts.

with scape and pedicel brownish yellow, flagellum light yellow, outer segments pale brown; segments long-oval with a circlet of about six black setae that are shorter than the segment. Head light brown; posterior vertex with long black setae.

Pronotum yellow, anteriorly narrowly brownish black. Mesothorax almost uniformly orange, without dark pattern. Halteres with stem whitened, knob slightly more yellowed. Legs with coxae orange; trochanters yellow; femora yellow, tips abruptly brownish black, including about the outer twelfth of segment; tibiae yellow, extreme bases and tips dark brown; tarsi yellow, outer two segments light brown. Wings (Fig. 1) pale yellow, prearcular and costal fields clearer yellow; stigma dark brown, conspicuous; veins of base and costal region yellowed, remaining veins brown. Longitudinal veins beyond general level of origin of *Rs* and cord with strong trichia, lacking on both Anals except for a very few at tips. Venation: *Rs* straight, R_{2+3+4} short and straight, slightly longer than the strongly arcuated basal section of R_5; veins beyond cord straight, generally parallel.

Basal abdominal segment yellowed, tergites two to six obscure yellow medially, lateral and posterior borders more blackened, seventh segment black; sternites yellowed medially, blackened on sides, especially posteriorly, seventh sternite black, remainder, including ovipositor, yellow.

Holotype. ♀, Ardehjan, Iran, September 11, 1956 (Schmid).

The most similar European species that have the apices of the femora blackened and the stigma of the wing dark are *Lipsothrix nobilis* Loew, *L. nervosa* Edwards and *L. nigristigma* Edwards, all with the thoracic dorsum conspicuously patterned with black. Of the above, *nervosa* has the darkened wing pattern somewhat less conspicuous, including the stigma, differing from the present fly in other characters, including the venation, the longitudinal veins beyond the cord being much shorter, with vein R_{2+3+4} long, about two-thirds *Rs*.

Cheilotrichia (*Empeda*) **gnoma**, n. sp.

Size very small (wing about 3–3.5 mm.); head and thorax dark gray; halteres yellow; legs brown; wings faintly tinted, stigma scarcely indicated; cell R_3 small, triangular in outline, cell *1st* M_2 closed; male hypopygium with both dististyles uniformly pale, outer style bifid, both arms expanded outwardly, inner style a long slender pale rod.

Male. Length about 3–3.3 mm.; wing 2.8–3.4 mm.

Female. Length about 3.4–3.7 mm.; wing 3–3.2 mm.

Rostrum and palpi black. Antennae black; pedicel much enlarged, verticils of basal flagellar segments very long. Head dark gray.

Thorax almost uniformly dark gray, praescutal stripes slightly darker. Halteres yellow. Legs with coxae and trochanters light brown; remainder of legs brown. Wings (Fig. 2) faintly tinted, stigmal darkening scarcely indicated; veins pale brown. Longitudinal veins beyond general level of origin of *Rs* with small trichia, including also about the outer half of *2nd A*. Venation: Sc_1 ending about opposite one-third to one-half *Rs*, Sc_1 about four to five times Sc_2; cell R_3 triangular in outline, vein R_3 oblique, straight or nearly so; cell *1st* M_2 closed; *m-cu* shortly beyond fork of *M*.

Abdomen brown, pleural region slightly darker. Male hypopygium (Fig. 5) with both dististyles, including the vestiture, pale; outer style large, bifid, the arms longer than the base, inner blade more cleaver-shaped, as shown, outer arm more oval; inner style about four-fifths as long, appearing as a long, very slender pale rod. Phallosome, *p*, about as figured, the aedeagus with an erect lateral darkened lobe near apex.

Holotype. ♂, Ardehjan, Iran, September 11, 1956 (Schmid).

Allotopotype. ♀. *Paratopotypes*. 14 ♂ ♀, on five pins.

The present fly appears certainly to belong to *Empeda* despite the venation which is very similar to that of *Gonempeda flava* (Schummel) and certain species in the typical subgenus *Cheilotrichia*. However the structure of the male hypopygium, including the dististyles, are much as in *Empeda* and I consider the reference to this subgenus to be correct. The fly is readily told by the very small size, venation, and in hypopygial details.

Erioptera (*Pseuderioptera*), n. subgen.

Wing (Fig. 3) with vein R_2 before the outer radial fork, leaving an element R_{3+4}; cell *1st* M_2 closed; vein *2nd A* with a low terminal bend. Trichia of wing veins very short and sparse, including the costal fringe; marginal setae of proximal two-thirds of posterior wing margin long and delicate; legs with elongate pale scales additional to the normal setae. Male hypopygium (Fig. 6) with both dististyles simple, subterminal; gonapophyses appearing as flattened paddlelike blades.

Type of subgenus. *Erioptera* (*Pseuderioptera*) **schmidi**, n. sp.

Other subgenera of *Erioptera* having interpolated scales on the legs include *Meterioptera* Alexander, *Tasiocerodes* Alexander, and *Teleneura* Alexander, all having the venational details and wing trichiation distinct.

Erioptera (*Pseuderioptera*) **schmidi**, n. sp.

Mesonotal praescutum yellow with a cinnamon brown median stripe, posterior sclerites of mesonotum and the pleura chiefly light yellow; femora yellow, tips brownish black; wings pale yellow with a very restricted pale brown pattern that includes the cord and apices of outer radial veins; vestiture of veins unusually short, including the costal fringe, lacking on nearly the basal third of wing; R_2 before fork of cell R_3, cell *1st* M_2 present; abdominal tergites light brown basally, yellowed posteriorly; male hypopygium with two simple dististyles; gonapophyses appearing as flattened blades, apices with microscopic spines.

Male. Length about 4 mm.; wing 4 mm.; antenna about 0.75 mm.

Rostrum and palpi light yellow. Antennae with scape and pedicel brownish black to black, flagellum light brown; flagellar segments oval, progressively smaller outwardly, verticils subequal in length to the segments. Front and anterior vertex silvery white, posterior vertex abruptly light brown; anterior vertex broad.

Pronotum light yellow, scutellum narrowly more darkened medially. Mesonotal praescutum with a cinnamon brown central stripe that ends some distance before suture, lateral stripes short and narrow, sides broadly light yellow; scutum light yellow, lobes chiefly cinnamon brown; scutellum and anterior mediotergite light yellow, posterior parts light brown. Pleura light yellow. Halteres yellow. Legs with coxae and trochanters light yellow; femora yellow, the relatively broad tips brownish black; remainder of legs yellow, outer tarsal segments darkened; legs with long narrow interpolated pale scales among the normal setae. Wings (Fig. 3) pale yellow, with very small and inconspicuous pale brown spots at Sc_2, R_1, R_{2+3}, R_3 and cord; veins yellow, darker in the patterned areas. Venation: Sc_2 far retracted, Sc_1 about opposite two-thirds Rs; R_2 before the radial fork, R_{3+4} variable in length, in the holotype longer than R_2, shorter in the paratype; *m-cu* before fork of M; vein *2nd A* conspicuously sinuous on outer fifth. Vestiture of veins unusually short, including the costal fringe; trichia of veins short and inconspicuous as compared with the normal condition in *Erioptera*, lacking on veins of about the basal third of wing.

Abdominal tergites bicolored, basally light brown, lateral and posterior borders light yellow,

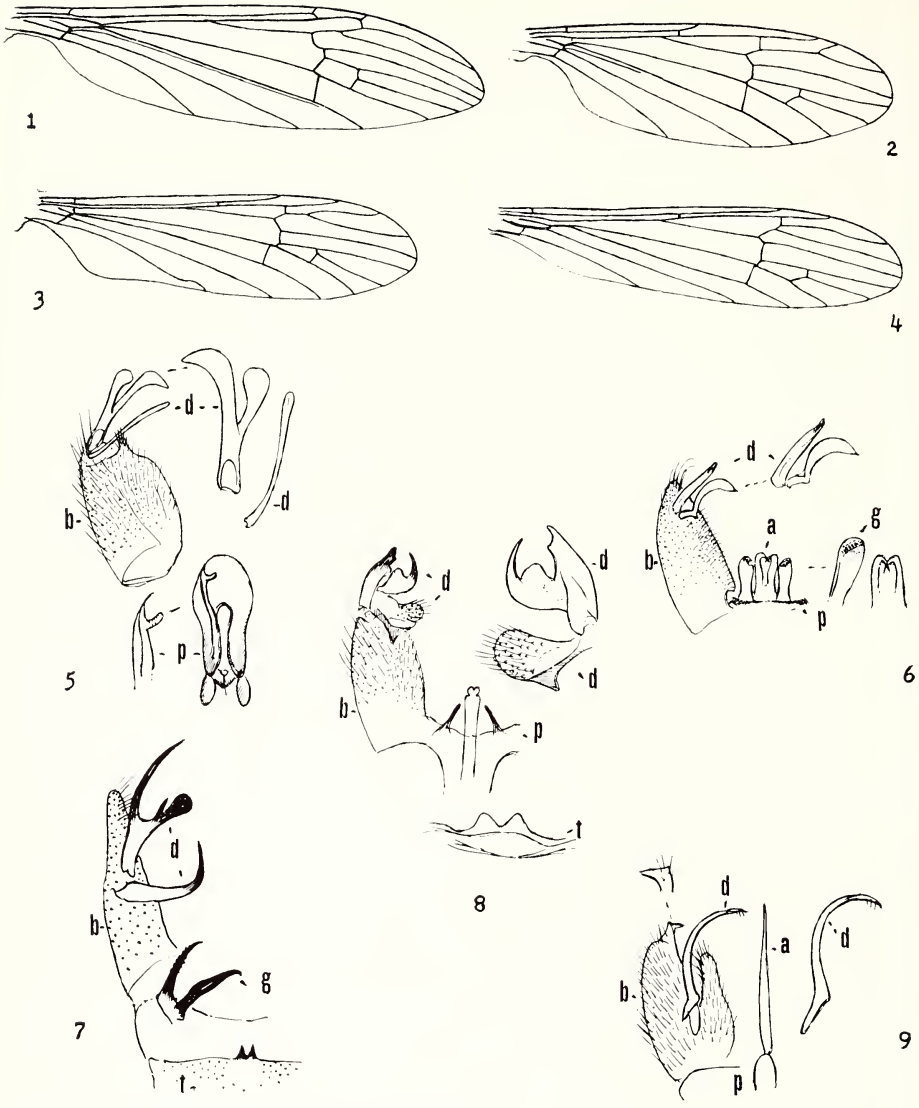

FIG. 1. *Lipsothrix iranica*, n. sp.; venation.
FIG. 2. *Cheilotrichia* (*Empeda*) *gnoma*, n. sp.; venation.
FIG. 3. *Erioptera* (*Pseuderioptera*) *schmidi*, n. sp.; venation.
FIG. 4. *Erioptera* (*Psiloconopa*) *cancriformis*, n. sp.; venation.
FIG. 5. *Cheilotrichia* (*Empeda*) *gnoma*, n. sp.; male hypopygium.
FIG. 6. *Erioptera* (*Pseuderioptera*) *schmidi*, n. sp.; male hypopygium.
FIG. 7. *Erioptera* (*Psiloconopa*) *iranica* Alexander; male hypopygium.
FIG. 8. *Erioptera* (*Psiloconopa*) *cancriformis*, n. sp.; male hypopygium.
FIG. 9. *Molophilus* (*Molophilus*) *pallidipes*, n. sp.; male hypopygium.
(Symbols: Male hypopygium—*a*, aedeagus; *b*, basistyle; *d*, dististyles; *g*, gonapophysis; *p*, phallosome; *t*, 9th tergite.)

sternites more uniformly yellow. Male hypopygium (Fig. 6) with the simple dististyles subterminal, apex of basistyle, *b*, short, narrowly obtuse, with long yellow setae, outer face of style subglabrous, mesal face with abundant shorter pale setae. Outer dististyle, *d*, a nearly straight slender rod, apex blackened; inner style subequal in length, appearing as a slightly curved flattened yellow blade, the apex a short acute point. Gonapophyses, *g*, appearing as a pair of flattened blades, apices with a row of microscopic spines; aedeagus, *a*, divided into paired rods, tips recurved into points.

Holotype. ♂, on slide, Dashte Maghan, Iran, September 29, 1956 (Schmid).

Paratopotype. Broken ♂, with the type.

This distinct fly is named for the collector of this fine series of Iranian Tipulidae, Dr. Fernand Schmid. It is readily separated from other generally similar members of the genus by the subgeneric characters as listed above, especially the retracted vein R_2 and the hypopygial structure.

Erioptera (*Psiloconopa*) **cancriformis**, n. sp.

General coloration of thorax light yellow, patterned with brown, pleura with a very narrow brown central stripe; knobs of halteres brown; wings whitened, without a stigmal darkening, veins light brown, *Sc* white; R_2 about one-half its length beyond the basal fork of *Rs*, cell *1st* M_2 closed; male hypopygium with outer dististyle bilobed, the lobes blackened and pointed, together suggesting a crabs claw; gonapophyses appearing as slender blackened rods.

Male. Length about 5 mm.; wing 4.2 mm.

Female. Length about 5.5–6 mm.; wing 5–5.2 mm.

Rostrum light brown; palpi black. Antennae light brown; flagellar segments oval, verticils short. Head buffy yellow, vertex more darkened medially, more intensely on anterior vertex.

Prothorax light yellow. Mesonotal praescutum very light brown, darker medially, with a still darker central vitta, humeral region light yellow; scutum brown, narrowly more darkened medially, the outer parts of lobes more diffusely darkened; scutellum light yellow, in male with a narrow darker central line. Pleura light yellow, ventral sternopleurite light brownish gray, central area of pleura with a very narrow brown line extending from base of fore coxa to beneath the root of haltere. Halteres with stem yellow, knob brown. Legs with coxae and trochanters light yellow; femora and tibiae obscure yellow, apices pale brown; tarsi light brown. Wings (Fig. 4) whitened, without a stigmal darkening; veins light brown, *Sc* whitened. Venation: Sc_1 ending about opposite or slightly before R_2, Sc_1 subequal to *Rs*; R_2 about one-half its length beyond the radial fork; cell *1st* M_2 closed; *m-cu* at or shortly before fork of *M*; vein *2nd A* virtually straight to slightly extended on distal fifth.

Abdomen yellow, tergites striped longitudinally with dark brown, posterior borders of segments narrowly yellow, sides more broadly so. Male hypopygium (Fig. 8) with the tergite, *t*, having the posterior border produced into two small triangular lobes, subequal in size to the median emargination. Outer dististyle, *d*, conspicuously bilobed into blackened points, the two lobes taken together suggesting a crabs claw, the outer part more obtuse with a smaller lobule on inner margin; inner style pale and fleshy, with abundant setae. Phallosome, *p*, including slender blackened rodlike apophyses; aedeagus slender, straight.

Holotype. ♂, Tegan, Iran, July 5, 1956 (Schmid).

Allotype. ♀, Durbadam, Iran, July 3, 1956.

Paratype. ♀, with the allotype.

Erioptera (*Psiloconopa*) *idiophallus* (Savtchenko), described as an *Ilisia* (1973) from the district Irshava, Transcarpathia, U.S.S.R., is generally similar but differs evidently in hypopygial structure.

Molophilus (*Molophilus*) **pallidipes**, n. sp.

General coloration of head light gray; thorax brownish gray, pleura brown; antennae short, brown; halteres light yellow; legs with femora and tibiae yellow, tips narrowly light brown; wings brownish yellow; male hypopygium with outer lobe of basistyle extended into a narrow pale plate; a single long slender dististyle.

Male. Length about 4.5–5 mm.; wing 4.5–5 mm.; antenna about 1.2–1.3 mm.

Rostrum and palpi dark brown. Antennae brown, scape and pedicel more yellowed; flagellar segments oval. Head light gray.

Pronotal scutum brown, scutellum light yellow. Mesonotal praescutum light to darker brownish gray, with darker brown stripes, lateral pair short and ill-defined; scutum brownish gray; scutellum yellowed, postnotum brownish gray. Pleura brown, dorsopleural membrane yellowed. Halteres light yellow. Legs with coxae and trochanters yellow; femora and tibiae yellow, tips narrowly light brown; tarsi brown. Wings brownish yellow, veins slightly darker, the vestiture darker brown.

Abdomen medium brown. Male hypopygium (Fig. 9) with outer lobe of basistyle, *b*, extended into a narrow pale plate, the apical margin farther produced into a point; inner lobe of style small and narrow, apically with long pale setae. A single dististyle, *d*, appearing as a long rod, gradually narrowed and curved to the acute twisted tip, apex acute. Aedeagus, *a*, subequal in length and diameter to the dististyle, outer fourth more narrowed.

Holotype. ♂, Pul-i-Zoghal, Iran, May 18, 1956 (Schmid).

Paratopotype. ♂, pinned with type.

Paratypes. 2 ♂♂, Barajan, Iran, 2000 meters, September 15, 1955; ♂, Mughan, June 20, 1956; ♂, Luis, September 14, 1955 (all Schmid).

The most similar regional species is *Molophilus* (*Molophilus*) *stroblianus* Nielsen (Zeitschr. Wien. Ent. Gesell., 38: 36, figs.; 1953), known from Austria and Czechslovakia, a dark colored fly with uniformly black legs, differing further in details of the male hypopygium.

DISTRIBUTIONAL RECORDS

Cheilotrichia (*Empeda*) *cinerascens* (Meigen)
Erioptera cinerascens Meigen; Klass., 1: 114; 1804.
Cheilotrichia (*Cheilotrichia*) *cinerascens* Edwards; Trans. Soc. Brit. Ent., 5: 119, pl. 5, fig. 12 (wing); text fig. 23b (hypopygium); 1938.
Europe. *Iran*: Kamalabad, October 1955 (Schmid).

Ormosia bivittata (Loew)
Rhypholophus bivittatus Loew; Beschr. Eur. Dipt., 3: 41; 1873.
Rhypholophus bivittatus de Meijere; Tijd. v. Ent., 63: 50, fig. 40 (hypopygium); 1920.
Rhypholophus (*Rhypholophus*) *bivittatus* Lackschewitz; Ann. naturhist. Mus. Wien, 50: 28; 1940.
Central Europe. *Iran*: Pul-i-Zoghal, October 12, 1956 (Schmid).

Erioptera (*Erioptera*) *fuscipennis* Meigen

Erioptera fuscipennis Meigen; Syst. Beschr. 1: 111; 1818.
Erioptera fuscipennis de Meijere; Tijd. v. Ent., 63: 75, fig. 70 (hypopygium); 1920.
Erioptera (*Erioptera*) *fuscipennis* Edwards; Trans. Soc. Soc. Brit. Ent., 5: 124, text fig. 24 g (hypopygium); 1938.
Europe. Iran: Babal, May 21, 1956; Emaret, May 21, 1956; Lius, 2200 meters, September 14, 1955; Quattekas, 1800 meters, September 19, 1955; Zanus, 2000 meters, September 21, 1955 (Schmid).

Erioptera (*Erioptera*) *trivialis* Meigen
Erioptera trivialis Meigen; Syst. Beschr. 1: 112; 1818.
Erioptera trivialis de Meijere; Tijd. v. Ent., 63: 75, 76, fig. 71 (hypopygium); 1920.
Erioptera (*Erioptera*) *trivialis* Edwards; Trans. Soc. Brit. Ent., 5: 125, text fig. 24 n (hypopygium); 1938.
Europe. Iran: Baranjan, 2000 meters, September 15, 1955; Lius, 2200 meters, September 14, 1955 (Schmid).

Erioptera (*Symplecta*) *hybrida* (Meigen)
Limnobia hybrida Meigen; Klass., 1: 57; 1804.
Symplecta punctipennis de Meijere; Tijd. v. Ent., 63: 77, 78, fig. 75 (hypopygium); 1920.
Erioptera (*Symplecta*) *hybrida* Edwards; Trans. Soc. Brit. Ent., 5: 126, pl. 5, fig. 5 (wing); text fig. 24 A, g (hypopygium); 1938.
Europe; *Asia*; *Northwestern North America. Iran*: Bar, June 30, 1956; Barajan, 2000 meters, September 15, 1955; Gurgan, April 1, 1956 (Schmid).

Erioptera (*Symplecta*) *stictica* (Meigen)
Limnobia stictica Meigen; Syst. Beschr. 1: 158; 1818.
Symplectomorpha stictica de Meijere; Tijd. v. Ent., 63: 78, fig. 76 (hypopygium); 1920.
Erioptera (*Symplecta*) *stictica* Edwards; Trans. Soc. Brit. Ent., 5: 128, pl. 5, fig. 4 (wing); 1938.
Eurasia; *western North America. Iran*: Cheshme, Ali, April 23, 1956; Ghulaman, July 8, 1956; Marus, June 28, 1956; Sefid Khok, June 1, 1956 (Schmid).

Erioptera (*Ilisia*) *maculata* Meigen
Erioptera maculata Meigen; Klass., 1: 61; 1804.
Acyphona maculata de Meijere; Tijd. v. Ent., 63: 67, 68, fig. 62 (hypopygium); 1920.
Erioptera (*Ilisia*) *maculata* Edwards; Trans. Soc. Brit. Ent., 5: 130–131, pl. 5, fig. 21 (wing); text fig. 25 a (hypopygium); 1938.
Europe, widespread. *Iran*: Ardehjan, September 9, 1956; Bar, June 30, 1956; Mughan, June 20, 1956; Pul-i-Zoghal, May 18, 1956 (Schmid).

Erioptera (*Psiloconopa*) *czizeki* (Bangerter)
Ilisia czizeki Bangerter; Mitteil. Schweiz. Ent. Gesell., 20: 353–354; 1947.
Erioptera (*Ilisia*) *czizeki* Starý; Časopis Moravského Musee, 55: 165, 166, fig. 19 (hypopygium); 1971 (not 1970, as printed).
Central and Eastern Europe. Iran: Nandeh, May 29, 1956 (Schmid).

Erioptera (*Psiloconopa*) *iranica* Alexander
Erioptera (*Psiloconopa*) *iranica* Alexander; Jour. New York Ent. Soc., **81**: 83–85; 1973.
Iran: Zanus, Mazanderan, September 21, 1955 (Schmid). Male hypopygium (Fig. 7).

Molophilus (*Molophilus*) *bifidus* Goetghebuer
Molophilus bifidus Goetghebuer; Bull. Soc. Ent. Belgique, 2: 135–136, fig. 9 (hypopygium); 1920.
Europe. Iran: Ochrid, 800 meters, August 9, 1955 (Schmid).

Molophilus (*Molophilus*) *pleuralis* de Meijere
Molophilus pleuralis de Meijere; Tijd. v. Ent., 63: 60–61, fig. 53 (hypopygium); 1920.
Molophilus pleuralis Edwards; Trans. Soc. Brit. Ent., 5: 144, text fig. 29 g (hypopygium); 1938.

Europe. Iran: Bar, June 30, 1956; Emaret, May 21, 1956; Lius, 2200 meters, September 14, 1955; Quattekas, September 19, 1955; Zanus, 2000 meters, September 21, 1955 (Schmid).

BOOK REVIEW

INSECT PHYSIOLOGY. Vincent B. Wigglesworth, 7th ed., 166 p. 1974. John Wiley & Sons. $4.95 paperbound ($8.95 cloth).

Sir Vincent's paperbound 7th edition is a real bargain at current book prices. Nearly 40 years after publishing the first edition, this new, revised little book is as readable an introductory account of insect physiology as only this masterful author can present. The brief, but complete survey of the subject can be recommended as a stimulating introduction to insect physiology for naturalists, biology students in high schools and colleges, and to scientists in other disciplines who would like to become acquainted with an authoritative and clear treatment of insect physiology. Each chapter is followed by a list of references, from Dietrich Bodenstein to J. de Wilde, with a fair sprinkling of Wigglesworth's own contributions to almost all subjects. There are adequate drawings, illustrating anatomical details. A subject index completes the book.

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